

SEQUENCE LISTING

<110> Behl, Christian  
Klostermann, Andreas

<120> Human semaphorin 6A-1 (SEMA6A-A), a gene involved  
in neuronal development and regeneration mechanisms  
during apoptosis, and its use as a potential drug target

<130> 48498-258443

<140> 09/856,681

<141> 2001-05-22

<150> PCT/EP99/09215

<151> 1999-11-26

<150> 98122441.3

<151> 1998-11-26

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<170> PatentIn Ver. 2.1

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| atg | agg | tca | gaa | gcc | ttg | ctg | cta | tat | ttc | aca | ctg | cta | cac | ttt | gct | 48 |
| Met | Arg | Ser | Glu | Ala | Leu | Leu | Leu | Tyr | Phe | Thr | Leu | Leu | His | Phe | Ala |    |
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| ggg | gct | ggt | ttc | cca | gaa | gat | tct | gag | cca | atc | agt | att | tcg | cat | ggc | 96 |
| Gly | Ala | Gly | Phe | Pro | Glu | Asp | Ser | Glu | Pro | Ile | Ser | Ile | Ser | His | Gly |    |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |    |

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| aac | tat | aca | aaa | cag | tat | ccg | gtg | ttt | gtg | ggc | cac | aag | cca | gga | cgg | 144 |
| Asn | Tyr | Thr | Lys | Gln | Tyr | Pro | Val | Phe | Val | Gly | His | Lys | Pro | Gly | Arg |     |
|     |     |     | 35  |     |     |     | 40  |     |     |     |     | 45  |     |     |     |     |

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| aac | acc | aca | cag | agg | cac | agg | ctg | gac | atc | cag | atg | att | atg | atc | atg | 192 |
| Asn | Thr | Thr | Gln | Arg | His | Arg | Leu | Asp | Ile | Gln | Met | Ile | Met | Ile | Met |     |
|     |     | 50  |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |     |

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| aac | gga | acc | ctc | tac | att | gct | gct | agg | gac | cat | att | tat | act | gtt | gat | 240 |
| Asn | Gly | Thr | Leu | Tyr | Ile | Ala | Ala | Arg | Asp | His | Ile | Tyr | Thr | Val | Asp |     |
|     | 65  |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |     |

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| ata | gac | aca | tca | cac | acg | gaa | gaa | att | tat | tgt | agc | aaa | aaa | ctg | aca | 288 |
| Ile | Asp | Thr | Ser | His | Thr | Glu | Glu | Ile | Tyr | Cys | Ser | Lys | Lys | Leu | Thr |     |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |     |

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| tgg aaa tct aga cag gcc gat gta gac aca tgc aga atg aag gga aaa | 336  |
| Trp Lys Ser Arg Gln Ala Asp Val Asp Thr Cys Arg Met Lys Gly Lys |      |
| 100 105 110   |      |
| cat aag gat gag tgc cac aac ttt att aaa gtt ctt cta aag aaa aac | 384  |
| His Lys Asp Glu Cys His Asn Phe Ile Lys Val Leu Leu Lys Lys Asn |      |
| 115 120 125   |      |
| gat gat gca ttg ttt gtc tgt gga act aat gcc ttc aac cct tcc tgc | 432  |
| Asp Asp Ala Leu Phe Val Cys Gly Thr Asn Ala Phe Asn Pro Ser Cys |      |
| 130 135 140   |      |
| aga aac tat aag atg gat aca ttg gaa cca ttc ggg gat gaa ttc agc | 480  |
| Arg Asn Tyr Lys Met Asp Thr Leu Glu Pro Phe Gly Asp Glu Phe Ser |      |
| 145 150 155 160   |      |
| gga atg gcc aga tgc cca tat gat gcc aaa cat gcc aac gtt gca ctg | 528  |
| Gly Met Ala Arg Cys Pro Tyr Asp Ala Lys His Ala Asn Val Ala Leu |      |
| 165 170 175   |      |
| ttt gca gat gga aaa cta tac tca gcc aca gtg act gac ttc ctt gcc | 576  |
| Phe Ala Asp Gly Lys Leu Tyr Ser Ala Thr Val Thr Asp Phe Leu Ala |      |
| 180 185 190   |      |
| att gac gca gtc att tac cgg agt ctt gga gaa agc cct acc ctg cgg | 624  |
| Ile Asp Ala Val Ile Tyr Arg Ser Leu Gly Glu Ser Pro Thr Leu Arg |      |
| 195 200 205   |      |
| acc gtc aag cac gat tca aaa tgg ttg aaa gaa cca tac ttt gtt caa | 672  |
| Thr Val Lys His Asp Ser Lys Trp Leu Lys Glu Pro Tyr Phe Val Gln |      |
| 210 215 220   |      |
| gcc gtg gat tac gga gat tat atc tac ttc ttc ttc agg gaa ata gca | 720  |
| Ala Val Asp Tyr Gly Asp Tyr Ile Tyr Phe Phe Phe Arg Glu Ile Ala |      |
| 225 230 235 240   |      |
| gtg gag tat aac acc atg gga aag gta gtt ttc cca aga gtg gct cag | 768  |
| Val Glu Tyr Asn Thr Met Gly Lys Val Val Phe Pro Arg Val Ala Gln |      |
| 245 250 255   |      |
| gtt tgt aag aat gat atg gga gga tct caa aga gtc ctg gag aaa cag | 816  |
| Val Cys Lys Asn Asp Met Gly Gly Ser Gln Arg Val Leu Glu Lys Gln |      |
| 260 265 270   |      |
| tgg acg tgc ttc ctg aag gcg cgc ttg aac tgc tca gtt cct gga gac | 864  |
| Trp Thr Ser Phe Leu Lys Ala Arg Leu Asn Cys Ser Val Pro Gly Asp |      |
| 275 280 285   |      |
| tct cat ttt tat ttc aac att ctc cag gca gtt aca gat gtg att cgt | 912  |
| Ser His Phe Tyr Phe Asn Ile Leu Gln Ala Val Thr Asp Val Ile Arg |      |
| 290 295 300   |      |
| atc aac ggg cgt gat gtt gtc ctg gca acg ttt tct aca cct tat aac | 960  |
| Ile Asn Gly Arg Asp Val Val Leu Ala Thr Phe Ser Thr Pro Tyr Asn |      |
| 305 310 315 320   |      |
| agc atc cct ggg tct gca gtc tgt gcc tat gac atg ctt gac att gcc | 1008 |
| Ser Ile Pro Gly Ser Ala Val Cys Ala Tyr Asp Met Leu Asp Ile Ala |      |
| 325 330 335   |      |

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| agt gtt ttt act ggg aga ttc aag gaa cag aag tct cct gat tcc acc   | 1056 |
| Ser Val Phe Thr Gly Arg Phe Lys Glu Gln Lys Ser Pro Asp Ser Thr   |      |
| 340 345 350   |      |
| tggtg aca cca gtt cct gat gaa cga gtt cct aag ccc agg cca ggt tgc | 1104 |
| Trp Thr Pro Val Pro Asp Glu Arg Val Pro Lys Pro Arg Pro Gly Cys   |      |
| 355 360 365   |      |
| tgt gct ggc tca tcc tcc tta gaa aga tat gca acc tcc aat gag ttc   | 1152 |
| Cys Ala Gly Ser Ser Ser Leu Glu Arg Tyr Ala Thr Ser Asn Glu Phe   |      |
| 370 375 380   |      |
| cct gat gat acc ctg aac ttc atc aag acg cac ccg ctc atg gat gag   | 1200 |
| Pro Asp Asp Thr Leu Asn Phe Ile Lys Thr His Pro Leu Met Asp Glu   |      |
| 385 390 395 400   |      |
| gca gtg ccc tcc atc ttc aac agg cca tgg ttc ctg aga aca atg gtc   | 1248 |
| Ala Val Pro Ser Ile Phe Asn Arg Pro Trp Phe Leu Arg Thr Met Val   |      |
| 405 410 415   |      |
| aga tac cgc ctt acc aaa att gca gtg gac aca gct gct ggg cca tat   | 1296 |
| Arg Tyr Arg Leu Thr Lys Ile Ala Val Asp Thr Ala Ala Gly Pro Tyr   |      |
| 420 425 430   |      |
| cag aat cac act gtg gtt ttt ctg gga tca gag aag gga atc atc ttg   | 1344 |
| Gln Asn His Thr Val Val Phe Leu Gly Ser Glu Lys Gly Ile Ile Leu   |      |
| 435 440 445   |      |
| aag ttt ttg gcc aga ata gga aat agt ggt ttt cta aat gac agc ctt   | 1392 |
| Lys Phe Leu Ala Arg Ile Gly Asn Ser Gly Phe Leu Asn Asp Ser Leu   |      |
| 450 455 460   |      |
| ttc ctg gag gag atg agt gtt tac aac tct gaa aaa tgc agc tat gat   | 1440 |
| Phe Leu Glu Glu Met Ser Val Tyr Asn Ser Glu Lys Cys Ser Tyr Asp   |      |
| 465 470 475 480   |      |
| gga gtc gaa gac aaa agg atc atg ggc atg cag ctg gac aga gca agc   | 1488 |
| Gly Val Glu Asp Lys Arg Ile Met Gly Met Gln Leu Asp Arg Ala Ser   |      |
| 485 490 495   |      |
| agc tct ctg tat gtt gcg ttc tct acc tgt gtg ata aag gtt ccc ctt   | 1536 |
| Ser Ser Leu Tyr Val Ala Phe Ser Thr Cys Val Ile Lys Val Pro Leu   |      |
| 500 505 510   |      |
| ggc cgg tgt gaa cga cat ggg aag tgt aaa aaa acc tgt att gcc tcc   | 1584 |
| Gly Arg Cys Glu Arg His Gly Lys Cys Lys Lys Thr Cys Ile Ala Ser   |      |
| 515 520 525   |      |
| aga gac cca tat tgt gga tgg ata aag gaa ggt ggt gcc tgc agc cat   | 1632 |
| Arg Asp Pro Tyr Cys Gly Trp Ile Lys Glu Gly Gly Ala Cys Ser His   |      |
| 530 535 540   |      |
| tta tca ccc aac agc aga ctg act ttt gag cag gac ata gag cgt ggc   | 1680 |
| Leu Ser Pro Asn Ser Arg Leu Thr Phe Glu Gln Asp Ile Glu Arg Gly   |      |
| 545 550 555 560   |      |

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| aat aca gat ggt ctg ggg gac tgt cac aat tcc ttt gtg gca ctg aat<br>Asn Thr Asp Gly Leu Gly Asp Cys His Asn Ser Phe Val Ala Leu Asn<br>565 570 575     | 1728 |
| ggg cat tcc agt tcc ctc ttg ccc agc aca acc aca tca gat tcg acg<br>Gly His Ser Ser Ser Leu Leu Pro Ser Thr Thr Thr Ser Asp Ser Thr<br>580 585 590     | 1776 |
| gct caa gag ggg tat gag tct agg gga gga atg ctg gac tgg aag cat<br>Ala Gln Glu Gly Tyr Glu Ser Arg Gly Gly Met Leu Asp Trp Lys His<br>595 600 605     | 1824 |
| ctg ctt gac tca cct gac agc aca gac cct ttg ggg gca gtg tct tcc<br>Leu Leu Asp Ser Pro Asp Ser Thr Asp Pro Leu Gly Ala Val Ser Ser<br>610 615 620     | 1872 |
| cat aat cac caa gac aag aag gga gtg att cgg gaa agt tac ctc aaa<br>His Asn His Gln Asp Lys Lys Gly Val Ile Arg Glu Ser Tyr Leu Lys<br>625 630 635 640 | 1920 |
| ggc cac gac cag ctg gtt ccc gtc acc ctc ttg gcc att gca gtc atc<br>Gly His Asp Gln Leu Val Pro Val Thr Leu Leu Ala Ile Ala Val Ile<br>645 650 655     | 1968 |
| ctg gct ttc gtc atg ggg gcc gtc ttc tcg ggc atc acc gtc tac tgc<br>Leu Ala Phe Val Met Gly Ala Val Phe Ser Gly Ile Thr Val Tyr Cys<br>660 665 670     | 2016 |
| gtc tgt gat cat cgg cgc aaa gac gtg gct gtg gtg cag cgc aag gag<br>Val Cys Asp His Arg Arg Lys Asp Val Ala Val Val Gln Arg Lys Glu<br>675 680 685     | 2064 |
| aag gag ctc acc cac tcg cgc cgg ggc tcc atg agc agc gtc acc aag<br>Lys Glu Leu Thr His Ser Arg Arg Gly Ser Met Ser Ser Val Thr Lys<br>690 695 700     | 2112 |
| ctc agc ggc ctc ttt ggg gac act caa tcc aaa gac cca aag ccg gag<br>Leu Ser Gly Leu Phe Gly Asp Thr Gln Ser Lys Asp Pro Lys Pro Glu<br>705 710 715 720 | 2160 |
| gcc atc ctc acg cca ctc atg cac aac ggc aag ctc gcc act ccc ggc<br>Ala Ile Leu Thr Pro Leu Met His Asn Gly Lys Leu Ala Thr Pro Gly<br>725 730 735     | 2208 |
| aac acg gcc aag atg ctc att aaa gca gac cag cac cac ctg gac ctg<br>Asn Thr Ala Lys Met Leu Ile Lys Ala Asp Gln His His Leu Asp Leu<br>740 745 750     | 2256 |
| acg gcc ctc ccc acc cca gag tca acc cca acg ctg cag cag aag cgg<br>Thr Ala Leu Pro Thr Pro Glu Ser Thr Pro Thr Leu Gln Gln Lys Arg<br>755 760 765     | 2304 |
| aag ccc agc cgc ggc agc cgc gag tgg gag agg aac cag aac ctc atc<br>Lys Pro Ser Arg Gly Ser Arg Glu Trp Glu Arg Asn Gln Asn Leu Ile<br>770 775 780     | 2352 |
| aat gcc tgc aca aag gac atg ccc ccc atg ggc tcc cct gtg att ccc<br>Asn Ala Cys Thr Lys Asp Met Pro Pro Met Gly Ser Pro Val Ile Pro<br>785 790 795 800 | 2400 |

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| acg gac ctg ccc ctg cgg gcc tcc ccc agc cac atc ccc agc gtg gtg | 2448 |
| Thr Asp Leu Pro Leu Arg Ala Ser Pro Ser His Ile Pro Ser Val Val |      |
| 805 810 815   |      |
| gtc ctg ccc atc acg cag cag ggc tac cag cat gag tac gtg gac cag | 2496 |
| Val Leu Pro Ile Thr Gln Gln Gly Tyr Gln His Glu Tyr Val Asp Gln |      |
| 820 825 830   |      |
| ccc aaa atg agc gag gtg gcc cag atg gcg ctg gag gac cag gcc gcc | 2544 |
| Pro Lys Met Ser Glu Val Ala Gln Met Ala Leu Glu Asp Gln Ala Ala |      |
| 835 840 845   |      |
| aca ctg gag tat aag acc atc aag gaa cat ctc agc agc aag agt ccc | 2592 |
| Thr Leu Glu Tyr Lys Thr Ile Lys Glu His Leu Ser Ser Lys Ser Pro |      |
| 850 855 860   |      |
| aac cat ggg gtg aac ctt gtg gag aac ctg gac agc ctg ccc ccc aaa | 2640 |
| Asn His Gly Val Asn Leu Val Glu Asn Leu Asp Ser Leu Pro Pro Lys |      |
| 865 870 875 880   |      |
| gtt cca cag cgg gag gcc tcc ctg ggt ccc ccg gga gcc tcc ctg tct | 2688 |
| Val Pro Gln Arg Glu Ala Ser Leu Gly Pro Pro Gly Ala Ser Leu Ser |      |
| 885 890 895   |      |
| cag acc ggt cta agc aag cgg ctg gaa atg cac cac tcc tct tcc tac | 2736 |
| Gln Thr Gly Leu Ser Lys Arg Leu Glu Met His His Ser Ser Ser Tyr |      |
| 900 905 910   |      |
| ggg gtt gac tat aag agg agc tac ccc acg aac tcg ctc acg aga agc | 2784 |
| Gly Val Asp Tyr Lys Arg Ser Tyr Pro Thr Asn Ser Leu Thr Arg Ser |      |
| 915 920 925   |      |
| cac cag gcc acc act ctc aaa aga aac aac act aac tcc tcc aat tcc | 2832 |
| His Gln Ala Thr Thr Leu Lys Arg Asn Asn Thr Asn Ser Ser Asn Ser |      |
| 930 935 940   |      |
| tct cac ctc tcc aga aac cag agc ttt ggc agg gga gac aac ccg ccg | 2880 |
| Ser His Leu Ser Arg Asn Gln Ser Phe Gly Arg Gly Asp Asn Pro Pro |      |
| 945 950 955 960   |      |
| ccc gcc ccg cag agg gtg gac tcc atc cag gtg cac agc tcc cag cca | 2928 |
| Pro Ala Pro Gln Arg Val Asp Ser Ile Gln Val His Ser Ser Gln Pro |      |
| 965 970 975   |      |
| tct ggc cag gcc gtg act gtc tcg agg cag ccc agc ctc aac gcc tac | 2976 |
| Ser Gly Gln Ala Val Thr Val Ser Arg Gln Pro Ser Leu Asn Ala Tyr |      |
| 980 985 990   |      |
| aac tca ctg aca agg tcg ggg ctg aag cgt acg ccc tcg cta aag ccg | 3024 |
| Asn Ser Leu Thr Arg Ser Gly Leu Lys Arg Thr Pro Ser Leu Lys Pro |      |
| 995 1000 1005   |      |
| gac gta ccc ccc aaa cca tcc ttt gct ccc ctt tcc aca tcc atg aag | 3072 |
| Asp Val Pro Pro Lys Pro Ser Phe Ala Pro Leu Ser Thr Ser Met Lys |      |
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 65 70 75 80  
 Ile Asp Thr Ser His Thr Glu Glu Ile Tyr Cys Ser Lys Lys Leu Thr  
 85 90 95  
 Trp Lys Ser Arg Gln Ala Asp Val Asp Thr Cys Arg Met Lys Gly Lys  
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 His Lys Asp Glu Cys His Asn Phe Ile Lys Val Leu Leu Lys Lys Asn  
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 Arg Asn Tyr Lys Met Asp Thr Leu Glu Pro Phe Gly Asp Glu Phe Ser  
 145 150 155 160  
 Gly Met Ala Arg Cys Pro Tyr Asp Ala Lys His Ala Asn Val Ala Leu  
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 Phe Ala Asp Gly Lys Leu Tyr Ser Ala Thr Val Thr Asp Phe Leu Ala  
 180 185 190  
 Ile Asp Ala Val Ile Tyr Arg Ser Leu Gly Glu Ser Pro Thr Leu Arg  
 195 200 205  
 Thr Val Lys His Asp Ser Lys Trp Leu Lys Glu Pro Tyr Phe Val Gln  
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 Ala Val Asp Tyr Gly Asp Tyr Ile Tyr Phe Phe Phe Arg Glu Ile Ala  
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 Val Glu Tyr Asn Thr Met Gly Lys Val Val Phe Pro Arg Val Ala Gln  
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 Pro Asp Asp Thr Leu Asn Phe Ile Lys Thr His Pro Leu Met Asp Glu  
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 Arg Tyr Arg Leu Thr Lys Ile Ala Val Asp Thr Ala Ala Gly Pro Tyr  
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 Gly Arg Cys Glu Arg His Gly Lys Cys Lys Lys Thr Cys Ile Ala Ser  
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Gly His Ser Ser Ser Leu Leu Pro Ser Thr Thr Thr Ser Asp Ser Thr  
 580 585 590  
 Ala Gln Glu Gly Tyr Glu Ser Arg Gly Gly Met Leu Asp Trp Lys His  
 595 600 605  
 Leu Leu Asp Ser Pro Asp Ser Thr Asp Pro Leu Gly Ala Val Ser Ser  
 610 615 620  
 His Asn His Gln Asp Lys Lys Gly Val Ile Arg Glu Ser Tyr Leu Lys  
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 Gly His Asp Gln Leu Val Pro Val Thr Leu Leu Ala Ile Ala Val Ile  
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 675 680 685  
 Lys Glu Leu Thr His Ser Arg Arg Gly Ser Met Ser Ser Val Thr Lys  
 690 695 700  
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Val Pro Gln Arg Glu Ala Ser Leu Gly Pro Pro Gly Ala Ser Leu Ser  
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Gln Thr Gly Leu Ser Lys Arg Leu Glu Met His His Ser Ser Ser Tyr  
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Gly Val Asp Tyr Lys Arg Ser Tyr Pro Thr Asn Ser Leu Thr Arg Ser  
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His Gln Ala Thr Thr Leu Lys Arg Asn Asn Thr Asn Ser Ser Asn Ser  
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Ser His Leu Ser Arg Asn Gln Ser Phe Gly Arg Gly Asp Asn Pro Pro  
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Pro Ala Pro Gln Arg Val Asp Ser Ile Gln Val His Ser Ser Gln Pro  
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Ser Gly Gln Ala Val Thr Val Ser Arg Gln Pro Ser Leu Asn Ala Tyr  
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Asn Ser Leu Thr Arg Ser Gly Leu Lys Arg Thr Pro Ser Leu Lys Pro  
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gcc tac aac tca ctg aca agg tcg ggg ctg aag cgt acg ccc tcg cta 144  
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35 40 45

aag ccg gac gta ccc ccc aaa cca tcc ttt gct ccc ctt tcc aca tcc 192  
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Gly Ala Gly Phe Pro Glu Asp Ser Glu Pro Ile Ser Ile Ser His Gly  
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His Lys Asp Glu Cys His Asn Phe Ile Lys Val Leu Leu Lys Lys Asn  
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Asp Asp Ala Leu Phe Val Cys Gly Thr Asn Ala Phe Asn Pro Ser Cys  
130 135 140

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| aga aac tat aag atg gat aca ttg gaa cca ttc ggg gat gaa ttc agc<br>Arg Asn Tyr Lys Met Asp Thr Leu Glu Pro Phe Gly Asp Glu Phe Ser<br>145 150 155 160 | 1137 |
| gga atg gcc aga tgc cca tat gat gcc aaa cat gcc aac gtt gca ctg<br>Gly Met Ala Arg Cys Pro Tyr Asp Ala Lys His Ala Asn Val Ala Leu<br>165 170 175     | 1185 |
| ttt gca gat gga aaa cta tac tca gcc aca gtg act gac ttc ctt gcc<br>Phe Ala Asp Gly Lys Leu Tyr Ser Ala Thr Val Thr Asp Phe Leu Ala<br>180 185 190     | 1233 |
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| acc gtc aag cac gat tca aaa tgg ttg aaa gaa cca tac ttt gtt caa<br>Thr Val Lys His Asp Ser Lys Trp Leu Lys Glu Pro Tyr Phe Val Gln<br>210 215 220     | 1329 |
| gcc gtg gat tac gga gat tat atc tac ttc ttc ttc agg gaa ata gca<br>Ala Val Asp Tyr Gly Asp Tyr Ile Tyr Phe Phe Phe Arg Glu Ile Ala<br>225 230 235 240 | 1377 |
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| tct cat ttt tat ttc aac att ctc cag gca gtt aca gat gtg att cgt<br>Ser His Phe Tyr Phe Asn Ile Leu Gln Ala Val Thr Asp Val Ile Arg<br>290 295 300     | 1569 |
| atc aac ggg cgt gat gtt gtc ctg gca acg ttt tct aca cct tat aac<br>Ile Asn Gly Arg Asp Val Val Leu Ala Thr Phe Ser Thr Pro Tyr Asn<br>305 310 315 320 | 1617 |
| agc atc cct ggg tct gca gtc tgt gcc tat gac atg ctt gac att gcc<br>Ser Ile Pro Gly Ser Ala Val Cys Ala Tyr Asp Met Leu Asp Ile Ala<br>325 330 335     | 1665 |
| agt gtt ttt act ggg aga ttc aag gaa cag aag tct cct gat tcc acc<br>Ser Val Phe Thr Gly Arg Phe Lys Glu Gln Lys Ser Pro Asp Ser Thr<br>340 345 350     | 1713 |
| tgg aca cca gtt cct gat gaa cga gtt cct aag ccc agg cca ggt tgc<br>Trp Thr Pro Val Pro Asp Glu Arg Val Pro Lys Pro Arg Pro Gly Cys<br>355 360 365     | 1761 |

|   |      |
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| tgt gct ggc tca tcc tcc tta gaa aga tat gca acc tcc aat gag ttc<br>Cys Ala Gly Ser Ser Ser Leu Glu Arg Tyr Ala Thr Ser Asn Glu Phe<br>370 375 380     | 1809 |
| cct gat gat acc ctg aac ttc atc aag acg cac ccg ctc atg gat gag<br>Pro Asp Asp Thr Leu Asn Phe Ile Lys Thr His Pro Leu Met Asp Glu<br>385 390 395 400 | 1857 |
| gca gtg ccc tcc atc ttc aac agg cca tgg ttc ctg aga aca atg gtc<br>Ala Val Pro Ser Ile Phe Asn Arg Pro Trp Phe Leu Arg Thr Met Val<br>405 410 415     | 1905 |
| aga tac cgc ctt acc aaa att gca gtg gac aca gct gct ggg cca tat<br>Arg Tyr Arg Leu Thr Lys Ile Ala Val Asp Thr Ala Ala Gly Pro Tyr<br>420 425 430     | 1953 |
| cag aat cac act gtg gtt ttt ctg gga tca gag aag gga atc atc ttg<br>Gln Asn His Thr Val Val Phe Leu Gly Ser Glu Lys Gly Ile Ile Leu<br>435 440 445     | 2001 |
| aag ttt ttg gcc aga ata gga aat agt ggt ttt cta aat gac agc ctt<br>Lys Phe Leu Ala Arg Ile Gly Asn Ser Gly Phe Leu Asn Asp Ser Leu<br>450 455 460     | 2049 |
| ttc ctg gag gag atg agt gtt tac aac tct gaa aaa tgc agc tat gat<br>Phe Leu Glu Glu Met Ser Val Tyr Asn Ser Glu Lys Cys Ser Tyr Asp<br>465 470 475 480 | 2097 |
| gga gtc gaa gac aaa agg atc atg ggc atg cag ctg gac aga gca agc<br>Gly Val Glu Asp Lys Arg Ile Met Gly Met Gln Leu Asp Arg Ala Ser<br>485 490 495     | 2145 |
| agc tct ctg tat gtt gcg ttc tct acc tgt gtg ata aag gtt ccc ctt<br>Ser Ser Leu Tyr Val Ala Phe Ser Thr Cys Val Ile Lys Val Pro Leu<br>500 505 510     | 2193 |
| ggc cgg tgt gaa cga cat ggg aag tgt aaa aaa acc tgt att gcc tcc<br>Gly Arg Cys Glu Arg His Gly Lys Cys Lys Lys Thr Cys Ile Ala Ser<br>515 520 525     | 2241 |
| aga gac cca tat tgt gga tgg ata aag gaa ggt ggt gcc tgc agc cat<br>Arg Asp Pro Tyr Cys Gly Trp Ile Lys Glu Gly Gly Ala Cys Ser His<br>530 535 540     | 2289 |
| tta tca ccc aac agc aga ctg act ttt gag cag gac ata gag cgt ggc<br>Leu Ser Pro Asn Ser Arg Leu Thr Phe Glu Gln Asp Ile Glu Arg Gly<br>545 550 555 560 | 2337 |
| aat aca gat ggt ctg ggg gac tgt cac aat tcc ttt gtg gca ctg aat<br>Asn Thr Asp Gly Leu Gly Asp Cys His Asn Ser Phe Val Ala Leu Asn<br>565 570 575     | 2385 |
| ggg cat tcc agt tcc ctc ttg ccc agc aca acc aca tca gat tgc acg<br>Gly His Ser Ser Ser Leu Leu Pro Ser Thr Thr Thr Ser Asp Ser Thr<br>580 585 590     | 2433 |
| gct caa gag ggg tat gag tct agg gga gga atg ctg gac tgg aag cat<br>Ala Gln Glu Gly Tyr Glu Ser Arg Gly Gly Met Leu Asp Trp Lys His<br>595 600 605     | 2481 |

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| ctg ctt gac tca cct gac agc aca gac cct ttg ggg gca gtg tct tcc<br>Leu Leu Asp Ser Pro Asp Ser Thr Asp Pro Leu Gly Ala Val Ser Ser<br>610 615 620     | 2529 |
| cat aat cac caa gac aag aag gga gtg att cgg gaa agt tac ctc aaa<br>His Asn His Gln Asp Lys Lys Gly Val Ile Arg Glu Ser Tyr Leu Lys<br>625 630 635 640 | 2577 |
| ggc cac gac cag ctg gtt ccc gtc acc ctc ttg gcc att gca gtc atc<br>Gly His Asp Gln Leu Val Pro Val Thr Leu Leu Ala Ile Ala Val Ile<br>645 650 655     | 2625 |
| ctg gct ttc gtc atg ggg gcc gtc ttc tcg ggc atc acc gtc tac tgc<br>Leu Ala Phe Val Met Gly Ala Val Phe Ser Gly Ile Thr Val Tyr Cys<br>660 665 670     | 2673 |
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| aag gag ctc acc cac tcg cgc cgg gcc tcc atg agc agc gtc acc aag<br>Lys Glu Leu Thr His Ser Arg Arg Gly Ser Met Ser Ser Val Thr Lys<br>690 695 700     | 2769 |
| ctc agc ggc ctc ttt ggg gac act caa tcc aaa gac cca aag ccg gag<br>Leu Ser Gly Leu Phe Gly Asp Thr Gln Ser Lys Asp Pro Lys Pro Glu<br>705 710 715 720 | 2817 |
| gcc atc ctc acg cca ctc atg cac aac ggc aag ctc gcc act ccc ggc<br>Ala Ile Leu Thr Pro Leu Met His Asn Gly Lys Leu Ala Thr Pro Gly<br>725 730 735     | 2865 |
| aac acg gcc aag atg ctc att aaa gca gac cag cac cac ctg gac ctg<br>Asn Thr Ala Lys Met Leu Ile Lys Ala Asp Gln His His Leu Asp Leu<br>740 745 750     | 2913 |
| acg gcc ctc ccc acc cca gag tca acc cca acg ctg cag cag aag cgg<br>Thr Ala Leu Pro Thr Pro Glu Ser Thr Pro Thr Leu Gln Gln Lys Arg<br>755 760 765     | 2961 |
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| acg gac ctg ccc ctg cgg gcc tcc ccc agc cac atc ccc agc gtg gtg<br>Thr Asp Leu Pro Leu Arg Ala Ser Pro Ser His Ile Pro Ser Val Val<br>805 810 815     | 3105 |
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 Thr Leu Glu Tyr Lys Thr Ile Lys Glu His Leu Ser Ser Lys Ser Pro  
 850 855 860

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&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 7

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Asn Thr Thr Gln Arg His Arg Leu Asp Ile Gln Met Ile Met Ile Met
      50           55           60

Asn Gly Thr Leu Tyr Ile Ala Ala Arg Asp His Ile Tyr Thr Val Asp
      65           70           75           80

Ile Asp Thr Ser His Thr Glu Glu Ile Tyr Cys Ser Lys Lys Leu Thr
          85           90           95

Trp Lys Ser Arg Gln Ala Asp Val Asp Thr Cys Arg Met Lys Gly Lys
          100          105          110

His Lys Asp Glu Cys His Asn Phe Ile Lys Val Leu Leu Lys Lys Asn
      115           120           125

Asp Asp Ala Leu Phe Val Cys Gly Thr Asn Ala Phe Asn Pro Ser Cys
      130           135           140

Arg Asn Tyr Lys Met Asp Thr Leu Glu Pro Phe Gly Asp Glu Phe Ser
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Gly Met Ala Arg Cys Pro Tyr Asp Ala Lys His Ala Asn Val Ala Leu
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Phe Ala Asp Gly Lys Leu Tyr Ser Ala Thr Val Thr Asp Phe Leu Ala
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Ile Asp Ala Val Ile Tyr Arg Ser Leu Gly Glu Ser Pro Thr Leu Arg
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Thr Val Lys His Asp Ser Lys Trp Leu Lys Glu Pro Tyr Phe Val Gln
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Ala Val Asp Tyr Gly Asp Tyr Ile Tyr Phe Phe Phe Arg Glu Ile Ala
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Val Glu Tyr Asn Thr Met Gly Lys Val Val Phe Pro Arg Val Ala Gln
          245           250           255

Val Cys Lys Asn Asp Met Gly Gly Ser Gln Arg Val Leu Glu Lys Gln
          260           265           270

Trp Thr Ser Phe Leu Lys Ala Arg Leu Asn Cys Ser Val Pro Gly Asp
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 Pro Asp Asp Thr Leu Asn Phe Ile Lys Thr His Pro Leu Met Asp Glu  
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 405 410 415  
 Arg Tyr Arg Leu Thr Lys Ile Ala Val Asp Thr Ala Ala Gly Pro Tyr  
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 Gln Asn His Thr Val Val Phe Leu Gly Ser Glu Lys Gly Ile Ile Leu  
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 Lys Phe Leu Ala Arg Ile Gly Asn Ser Gly Phe Leu Asn Asp Ser Leu  
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 Phe Leu Glu Glu Met Ser Val Tyr Asn Ser Glu Lys Cys Ser Tyr Asp  
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 Gly Val Glu Asp Lys Arg Ile Met Gly Met Gln Leu Asp Arg Ala Ser  
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 Arg Asp Pro Tyr Cys Gly Trp Ile Lys Glu Gly Gly Ala Cys Ser His  
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 580 585 590  
 Ala Gln Glu Gly Tyr Glu Ser Arg Gly Gly Met Leu Asp Trp Lys His  
 595 600 605

Leu Leu Asp Ser Pro Asp Ser Thr Asp Pro Leu Gly Ala Val Ser Ser  
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 675 680 685  
 Lys Glu Leu Thr His Ser Arg Arg Gly Ser Met Ser Ser Val Thr Lys  
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